

nascentium vel ad utilitatem latius excultarum; auct. Jos. Moris et Jos. De Notaris.—Amphibia Europæa ad Systema nostrum Vertebratorium ordinata; auct. Car. L. Bonaparte, Muxiniani Principe.—Microscopic Observations on the Movements of Vegetable Globules suspended in a Menstruum; by Prof. J. D. Botto.

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Feb. 17.—A paper was read by Mr. Owen, "On the Microscopic Structure of certain Fossil Teeth from the Old Red Sandstone near Elgin."

The fossils were from the middle or cornstone division of that formation, and are interesting from the extreme rarity of organic remains referrible to vertebrated animals in such formation. The microscopic structure of these teeth, which Mr. Owen described in detail, is quite peculiar and characteristic of the teeth in question, so as to justify the indication of a distinct genus of animals, for which the name of *Dendrodus* was proposed.

Four species of these teeth were described, viz. *Dend. bifurcatus*, *D. strigatus*, *D. hastatus* and *D. sigmoideus*, and the modifications of the Dendritic structure pointed out in each.

Upon the whole, the characters of the microscopic structure resemble those of the teeth of certain fishes, as the Shark, Sphyræna, etc., but with modifications that approximate it to the peculiar structure of the teeth of the extinct Batrachian genus *Labyrinthodon*, from the new red sandstone.

Mr. Owen concludes, therefore, that the *Dendrodus* was a fish, but that it might have approached more nearly than the rest of the class to the Labyrinthodont group of *Batrachia*. The teeth resemble in external form and longitudinal striation those of the *Labyrinthodon*; and should other remains raise the *Dendrodus* to that order, it will be the first vertebrate animal higher than fish that has been found in the old red sandstone.

Sections of the teeth described and diagrams were exhibited in illustration of the paper.

Mr. Owen next proceeded to give an account of his examination of the microscopic structure of the teeth of the *Lepidosiren annectens*.

Although almost the whole organization of this species is known, there is as much doubt in the minds of many naturalists respecting the class of Vertebrata to which it really belongs, as may be entertained regarding the *Dendrodus*, of which only the teeth have been examined.

Mr. Owen referred to the grounds on which he had concluded the *Lepidosiren* to be essentially a fish (Linnæan Trans., xviii. p. 350), and to the subsequent anatomical description of the animal by Dr. Bischoff, who considers it to be a reptile; and he then proceeded to describe the microscopic structure of the teeth of the species from the Gambia, and to show, according to this additional test of its affi-

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nities, that it must be regarded as a true fish. The body of the tooth consists of a coarse dentine traversed by numerous large anastomosing medullary canals, without any trace of Purkinjian corpuscles: this is coated by a thin layer of dense dentine, traversed by fine calcigerous tubes continued from the peripheral loops of the medullary canal.

This structure agrees with that modification which is most characteristic of the class of Fishes, and has not been found in the teeth of any of the Perennibranchiate Reptiles. The cumulative evidence of this fact, with the ichthyic type of the microscopic structure of the ossified parts of the skeleton; the disposition of these parts, forming double superior and inferior spinous processes, a pre-opercular bone, and their green colour; the gelatino-cartilaginous vertebral style; the many-jointed ray of the rudimentary fin; large cycloid scales; the intestinal spiral valve; six pairs of branchial arches, with gills concealed and protected by an operculum; the blind nasal plicated sacs: these, receiving the additional evidence from the intimate structure, as before from the form, number and attachment of the teeth, must outweigh the argument for its amphibious character, which is supported only by the lung-like structure of its divided air-bladder,—a structure which some Malacopterygious Sauroid fishes possess in common with the *Lepidosiren*.

Professor Ehrenberg of Berlin, and Professor Purkinje of Breslau, were elected Honorary Members, and Daniel Cooper, Esq., an Ordinary Member of the Society.

March 17.—George Loddiges, Esq., in the Chair.

A paper was read by George Busk, Esq., of the hospital-ship Dreadnought, “On the Anatomy of *Tricocephalus dispar*,” in which the author directs attention to certain points in the anatomy of that Entozoon, upon which all helminthologists appear to have erred.

The author, after describing minutely the structure and arrangement of the digestive and generative systems, arrives at the following conclusions:—1st. That the *Tricocephalus* has a distinct vulva, and that the generative and digestive tubes do not communicate at a cloaca, nor terminate at a common orifice, as described by all writers on the subject. 2nd. That in the presence and situation of the vulva this Entozoon obviously very closely resembles the *Strongylus* and most other nematoid worms, and thus an apparently great anomaly in the arrangement of this class is removed. 3rd. That the alimentary canal is not so simple as is commonly supposed. 4th. That the *Tricocephalus* is in all probability simply oviparous, and that the ova become perfectly formed only a short distance from the orifice, perhaps from being there only within reach of the male fluid.

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The following communications were read:—

1. Notice of *Carum bulbocastanum*, Koch, from two English localities, by Mr. Isaac Brown, Hitchin, Herts. Mr. Brown pointed

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2. Notes on *Physospermum cornubiense*, and an account of its discovery near Tavistock, in Devonshire, by the Rev. W. S. Hore, Stoke, Devonport. Mr. Hore, in collecting this plant at Bodmin, in Cornwall, its original and only known English locality, observed, that it was chiefly in oak coppices that it seemed to be found. In August last he noticed a single specimen of it in a hedge-row between Newbridge and Tavistock, and being induced to enter a neighbouring oak coppice in search of it, he there found it in considerable abundance. The root, he observes, fits it admirably to contend with the brambles and brushwood amongst which it grows.

3. Notice of a curious variety of *Scolopendrium vulgare*, found near Arbroath, by Mr. W. C. Trevelyan. Specimens were presented having the midrib prolonged in a remarkable manner nearly an inch beyond the termination of the frond.

4. An attempt to ascertain the true *Hypericum quadrangulum* of Linnæus, by Mr. Charles C. Babington. Mr. Babington was led to make the present inquiry in consequence of specimens collected by the Rev. T. B. Bell, in Arran, having been distributed by the Botanical Society, named *Hypericum dubium*, which appeared different from the English plant so called. Much confusion has arisen regarding this species, from its appearing from the Linnæan Herbarium that *two* species have been included by Linnæus under the name of *quadrangulum*, viz. *H. dubium* of Leers, and *H. quadrangulum* of Smith. Mr. Babington, after a careful examination of specimens and reference to numerous authorities, proposed that the following names should be adopted:—1. *H. quadrangulum*, Linn. (Hort. Cliff.); English Bot., tab. 370, &c., being the plant named *H. tetrapterum* by Mr. Babington in his *Primitiæ Floræ Sarnicæ*, and in Leighton's Flora of Shropshire. 2. *H. dubium*, Leers; English Bot., tab. 296, &c., being the plant from Arran before alluded to. 3. *H. maculatum*, Crantz (Flora Austr. ed. alt.), being the *H. delphinense* of Villar's Fl. Delph.; *H. quadrangulum* of Leighton's Flora of Shropshire, and the plant usually considered *H. dubium* by English botanists.

5. On the Geographical Distribution of British Ferns, by Mr. Hewett Cottrell Watson. In the outset of this paper Mr. Watson remarks that, "excepting some spots of small extent, whence they are banished by local peculiarities of surface, Ferns may be said to range over the whole of Britain, from south to north, from east to west, and from the shores of the sea almost to the summits of the loftiest mountains; from which latter situation they are probably absent rather in consequence of the bleak exposure to wind, than of the diminished temperature incidental to the height of any of our mountains." Assuming 40 as the medium number of the species of British Ferns, and 1400 as that of the Flowering Plants, it appears that 1 to 35 is the proportion which the former

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bear to the latter. Then follows a table showing the proportions which they hold in several neighbouring islands and continental districts, ranging from 1 to 25 to 1 to 67. A similar comparison is instituted with regard to 20 of our most complete Local Floras, showing nearly the same results. A subsequent table exhibits the frequency of occurrence of each of the British species of Ferns throughout the 20 Local Floras above mentioned, and 24 local lists communicated by correspondents in various parts of England and Scotland and the adjacent islands.

Several donations were presented, amongst which may be noticed—1. An old Herbarium, which, from the handwriting, and the references to Parkinson's Herbal, appears to have been made in England during the latter part of the seventeenth century; from David Laing, of the Writers to the Signets' Library. 2. A Catalogue of 235 species of Flowering Plants, found in the Shetland Islands, by Mr. Thomas Edmondston, Jun. 3. A Catalogue of Plants found near Audley End, Essex, by the Rev. J. E. Leefe.

LINNEAN SOCIETY.

December 15, 1840.—Mr. Forster, V.P., in the Chair.

Read, an "Account of two new Genera of Plants, allied to *Olacineæ*." By George Bentham, Esq., F.L.S.

The two new genera on which this paper is founded are *Pogopetalum*, Benth., collected by Mr. Schomburgk in British Guiana; and *Apodytes*, named but not described by Prof. Ernst Meyer, among the South African plants collected by Drège. A third genus, *Leretia* of Vellozo, figured in the 'Flora Fluminensis,' is also characterized for the first time.

After noticing the opinions of various authors as to the affinities of *Olacineæ*, and enumerating the genera hitherto referred to that family, Mr. Bentham enters into a detailed examination of its characters and of their modifications in the different genera, the most important of which he condenses into the following character of the Order.

Ord. OLACINEÆ.

Calyx parvus, liber v. basi adnatus, truncatus v. denticulatus, fructifer persistens immutatus v. auctus. *Corollæ* petala 4, 5, v. 6 hypogyna v. subperigyna, subcoriacea, æstivatione valvata, libera v. per paria connexa v. basi in tubum coalita. *Stamina* definita, cum petalis inserta, iis coalita v. libera, numero petalorum dupla v. æqualia fertilia rariùs asymmetrica, alterna sæpe sterilia difformia. *Antheræ* introrsæ, biloculares, loculis rimâ longitudinali dehiscentibus. *Ovarium* toro nunc parvo, nunc incrassato et interdum cum calyce concreto insidens, 1-loculare (nunc spurie et incompletè 3—4-loculare) v. rariùs excentricè 3-loculare. *Ovula* in loculo 2, 3 v. 4 collateralia, rariùs solitaria, ab apice placentæ liberæ v. ovario v. dissepimentis spuriis connatæ pendula, anatropa. *Stylus* erectus, simplex, stigmate nunc truncato tenui, nunc incrassato 2—3—4-lobo. *Drupa* calyce immutato stipata v. ampliata cincta, velata v. adnata, pericarpio tenui carnoso v. exsucco, putamine crustaceo v. osseo, abortu 1-spermo, rariùs 2—3-spermo. *Semen* inversum, v. sæpiùs placentâ cum illo a basi concretâ spurie erectum, umbilico lato basilari affixum. *Embryo* in axi albuminis copiosi carnosus, rectus, apici fructûs proximus, nunc brevissimus, rariùs dimidio albu-

bear to the latter. Then follows a table showing the proportions which they hold in several neighbouring islands and continental districts, ranging from 1 to 25 to 1 to 67. A similar comparison is instituted with regard to 20 of our most complete Local Floras, showing nearly the same results. A subsequent table exhibits the frequency of occurrence of each of the British species of Ferns throughout the 20 Local Floras above mentioned, and 24 local lists communicated by correspondents in various parts of England and Scotland and the adjacent islands.

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Calyx parvus, liber v. basi adnatus, truncatus v. denticulatus, fructifer persistens immutatus v. auctus. *Corollæ* petala 4, 5, v. 6 hypogyna v. subperigyna, subcoriacea, æstivatione valvata, libera v. per paria connexa v. basi in tubum coalita. *Stamina* definita, cum petalis inserta, iis coalita v. libera, numero petalorum dupla v. æqualia fertilia rariùs asymmetrica, alterna sæpe sterilia difformia. *Antheræ* introrsæ, biloculares, loculis rimâ longitudinali dehiscentibus. *Ovarium* toro nunc parvo, nunc incrassato et interdum cum calyce concreto insidens, 1-loculare (nunc spurie et incompletè 3—4-loculare) v. rariùs excentricè 3-loculare. *Ovula* in loculo 2, 3 v. 4 collateralia, rariùs solitaria, ab apice placentæ liberæ v. ovario v. dissepimentis spuriis connatæ pendula, anatropa. *Stylus* erectus, simplex, stigmate nunc truncato tenui, nunc incrassato 2—3—4-lobo. *Drupa* calyce immutato stipata v. ampliata cincta, velata v. adnata, pericarpio tenui carnoso v. exsucco, putamine crustaceo v. osseo, abortu 1-spermo, rariùs 2—3-spermo. *Semen* inversum, v. sæpiùs placentâ cum illo a basi concretâ spurie erectum, umbilico lato basilari affixum. *Embryo* in axi albuminis copiosi carnosî, rectus, apici fructûs proximus, nunc brevissimus, rariùs dimidio albu-

bear to the latter. Then follows a table showing the proportions which they hold in several neighbouring islands and continental districts, ranging from 1 to 25 to 1 to 67. A similar comparison is instituted with regard to 20 of our most complete Local Floras, showing nearly the same results. A subsequent table exhibits the frequency of occurrence of each of the British species of Ferns throughout the 20 Local Floras above mentioned, and 24 local lists communicated by correspondents in various parts of England and Scotland and the adjacent islands.

Several donations were presented, amongst which may be noticed—1. An old Herbarium, which, from the handwriting, and the references to Parkinson's Herbal, appears to have been made in England during the latter part of the seventeenth century; from David Laing, of the Writers to the Signets' Library. 2. A Catalogue of 235 species of Flowering Plants, found in the Shetland Islands, by Mr. Thomas Edmondston, Jun. 3. A Catalogue of Plants found near Audley End, Essex, by the Rev. J. E. Leefe.

LINNEAN SOCIETY.

December 15, 1840.—Mr. Forster, V.P., in the Chair.

Read, an "Account of two new Genera of Plants, allied to *Olacineæ*." By George Bentham, Esq., F.L.S.

The two new genera on which this paper is founded are *Pogopetalum*, Benth., collected by Mr. Schomburgk in British Guiana; and *Apodytes*, named but not described by Prof. Ernst Meyer, among the South African plants collected by Drège. A third genus, *Leretia* of Vellozo, figured in the 'Flora Fluminensis,' is also characterized for the first time.

After noticing the opinions of various authors as to the affinities of *Olacineæ*, and enumerating the genera hitherto referred to that family, Mr. Bentham enters into a detailed examination of its characters and of their modifications in the different genera, the most important of which he condenses into the following character of the Order.

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minis longior, radiculâ apicem fructûs spectante brevissimâ, cotyledonibus semiteretibus, plumulâ inconspicuâ. *Arbores* v. *frutices erecti* v. *interdum scandentes*, *inermes* v. *ramis axillaribus spinescentibus armati*, *glabri* v. *parcè pubescentes*. *Folia* alterna, simplicia, integerrima, exstipulata, glandulosa. *Flores* hermaphroditi, v. abortu polygami, nunc axillares distinctè v. irregulariter racemosi, spicati v. cymosi, nunc terminales cymoso-paniculati, rariùs solitarii laterales v. axillares. *Bracteæ* squamæformes, sæpiùs minutæ, rariùs juniores imbricatæ. *Bracteolæ* parvæ in cupulam connatæ v. nullæ.

Mr. Bentham distinguishes three tribes characterized as follows :

Trib. I. OLACEÆ. *Ovarium* basi dissepimentis spuriis (rariùs evanidis) 3—4-loculare, apice 1-loculare, placentâ centrali dissepimentis spuriis basi adhærente supernè liberâ. *Ovula* tot quot loculi spurii ex apice placentæ pendula. *Semen* erectum. *Inflorescentia* axillaris, racemosa, racemis rariùs ad florem unicum reductis.

Trib. II. OPILIEÆ. *Ovarium* a basi 1-loculare. *Ovulum* (saltem per anthesin) unicum, minimum, ab apice placentæ liberæ centralis pendulum. *Stylus* centricus. *Semen* erectum. *Inflorescentia* axillaris, racemosa.

Trib. III. ICACINEÆ. *Ovarium* a basi 1-loculare, v. excentricè et completè 3-loculare. *Ovula* in quoque loculo duo, ab apice placentæ hinc ovario adnatæ collateraliter affixa, pendula, in loculo superposita, placentâ alterâ elongatâ. *Stylus* excentricus. *Semen* pendulum. *Inflorescentia* cymosa, axillaris v. terminalis.

To the first tribe Mr. Bentham refers *Heisteria*, L., *Ximenia*, L., *Olaæ*, L. (including *Spermazyrum*, Labill., and *Fissilia*, Comm.), and *Schæpfia*, L. ; to the second, *Opilia*, Roxb. (including *Groutia*, Guill.), and *Cansjera*, Lam. ; and to the third, *Gomphandra*, Wall., *Ikacina*, A. Juss., *Apodytes*, *Leretia* and *Pogopetalum*.

He considers *Schæpfia* to be far removed from *Loranthaceæ* by the structure of its ovary, while it differs from *Symplocos* in the æstivation of its corolla and the incomplete division of its ovary,—two points in which it agrees remarkably with *Olaæ* and *Ximenia*. He describes the greater part of its ovary as well as the margin of its calyx as free, and states that an adherence almost as complete exists in some species of *Olaæ*. The gamopetalous corolla he regards as a character of little consequence in orders where the æstivation is valvate, and as existing to a considerable degree in *Olaæ* itself. In *Schæpfia* the stamens are more closely adherent to the corolla, but the filaments are filiform and prominent from the base of the latter, and are not confounded with its substance.

He states *Cansjera* to differ from *Thymeleæ*, to which it is usually referred, in the nature of the floral envelopes, in the position of the stamens, and in the structure of the ovary and of the fruit ; and adds, that in all these points it agrees with *Opilia*, from which it differs only in the adherence of its petals.

The genera *Apodytes*, *Leretia* and *Pogopetalum* are characterized as follows :

APODYTES.

Flores hermaphroditi. *Calyx* parvus, immutatus. *Petala* 4, 5. *Stamina* totidem, iis alterna, sterilia nulla. *Ovarium* 1-loculare. *Fructus* ovato-

minis longior, radiculâ apicem fructûs spectante brevissimâ, cotyledonibus semiteretibus, plumulâ inconspicuâ. *Arbores* v. *frutices erecti* v. *interdum scandentes*, *inermes* v. *ramis axillaribus spinescentibus armati*, *glabri* v. *parcè pubescentes*. *Folia* alterna, simplicia, integerrima, exstipulata, glandulosa. *Flores* hermaphroditi, v. abortu polygami, nunc axillares distinctè v. irregulariter racemosi, spicati v. cymosi, nunc terminales cymoso-paniculati, rariùs solitarii laterales v. axillares. *Bracteæ* squamæformes, sæpiùs minutæ, rariùs juniores imbricatæ. *Bracteolæ* parvæ in cupulam connatæ v. nullæ.

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LERETIA.

Flores hermaphroditi, v. abortu masculi. *Calyx* parvus, immutatus. *Petalata* 5, intus villosa. *Stamina* totidem, iis alterna, sterilia nulla. *Ovarium* 1-loculare. *Fructus* (ex icone Fl. Flum.) depresso-globosus. *Inflorescentia* axillaris, laxa.

POGOPETALUM.

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Of the latter genus two species are characterized :

P. orbiculatum, foliis ovato-orbiculatis obtusissimis subtus ramulisque incanis, ovario hispido.—A shrub ten or twelve feet in height, found in dry Savannahs on the Padawire River, *Schomburgk*.

P. acuminatum, foliis ovatis oblongisve acuminatis subtus vix pallidioribus, ovario glabro.—A tree of about thirty feet high, growing on the high banks of the Rio Negro, *Schomburgk*, n. 970.

Mr. Bentham suggests that the three tribes above characterized may perhaps, when better known, be considered as distinct orders. He thinks, however, that the species of *Olex* in which the dissepiments of the ovary are almost entirely obliterated form a transition to *Opilicæ*; that *Gomphandra* connects *Opilicæ* with *Icacineæ*; and that *Pogopetalum* is in many respects equally allied to *Olaceæ* and to *Icacineæ*. He states that *Olaceæ* approach most nearly to the polypetalous orders with which *Olacineæ* have been compared; but he cannot admit of the supposed affinity between them and *Aurantiaceæ*. *Humiriaceæ* are, he thinks, among Dichlamydeous plants, those which come nearest to *Olacineæ*; and he considers *Styraceæ* (including *Symploceæ* and *Halesiaceæ* of Don) to be very near both to *Humiriaceæ* and *Olacineæ*. *Corneæ* and some other albuminous orders have also, in his opinion, some relation to them, but much more distant.

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In the notes to the paper Mr. Bentham characterizes several undescribed species of *Olaæ* in the following terms :

- *O. nana* (Wall. Cat. Herb. Ind. n. 6783.) suffruticosa? glabriuscula, ramis erectis parcè ramosis, foliis subsessilibus oblongis lanceolatisve obtusis vix mucronulatis, pedicellis axillaribus solitariis 1-floris, calyce libero, staminibus sterilibus bifidis.—*Napalia*? *Wallich*.
- O. acuminata* (Wall. l. c. n. 6781.), fruticosa scandens? glabra, ramis angulatis, foliis ovato-lanceolatis acuminatis, racemis brevibus distichis paucifloris, calyce toro incrassato basi breviter adnato, staminibus sterilibus bifidis.—*Sillet*, *Wallich*.
- O. macrophylla*, glaberrima, foliis ovato-lanceolatis acuminatis inæquilateralis, racemis axillaribus brevibus distichis, calycibus glabris ovarii basi adnatis: margine libero truncato, staminibus sterilibus integris v. vix emarginatis, ovario glabro.—In Monte Padawan Guianæ Anglicæ, *Schomburgk*.
- O. pauciflora*, foliis ovatis junioribus ramulis pedicellisque puberulis, pedunculis axillaribus 1—3-floris, calycibus molliter pubescentibus ovarii basi adnatis: margine libero brevissimo truncato, staminibus sterilibus longè bifidis, ovario villosa.—*Serra Acurua* Provincie Bahiensis Brasilæ; *Blanchet*, n. 2795.—An huc *Dulacia singularis*, Vell. Fl. Flum.?

January 19, 1841.—Mr. Forster, V.P., in the Chair.

Mr. Mann, F.L.S., exhibited a specimen of *Sedum Telephium*, which had been preserved for two years in his Herbarium, and still continued to send forth buds.

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CLIOCOCCA.

Sepala 5, integra. *Petala* 5, in æstivatione imbricata. *Stamina* 5. *Cap-sula* 10-locularis; *loculis* clausis indehiscentibus.

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In the notes to the paper Mr. Bentham characterizes several undescribed species of *Olaæ* in the following terms :

- *O. nana* (Wall. Cat. Herb. Ind. n. 6783.) suffruticosa? glabriuscula, ramis erectis parcè ramosis, foliis subsessilibus oblongis lanceolatisve obtusis vix mucronulatis, pedicellis axillaribus solitariis 1-floris, calyce libero, staminibus sterilibus bifidis.—*Napalia*? *Wallich*.
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- O. macrophylla*, glaberrima, foliis ovato-lanceolatis acuminatis inæquilateralis, racemis axillaribus brevibus distichis, calycibus glabris ovarii basi adnatis: margine libero truncato, staminibus sterilibus integris v. vix emarginatis, ovario glabro.—In Monte Padawan Guianæ Anglicæ, *Schomburgk*.
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He thinks with M. Morren that the pitcher originates from the lamina of the leaf, the margins of which become united at an early period ; while he regards the operculum as formed upon the plan of the cucullate sepal and petals of *Aconitum*, and derived from the apex of the leaf. He regards the pitchers of *Sarracenia* as formed upon the same principle ; but compares those of *Cephalotus* to the labellum of *Cypripedium*, the modified leaf being produced anteriorly into a pouch, and the operculum being posterior, and not anterior, as in *Nepenthes*.

The cuticle of the upper surface of the expanded part of the petiole of *Nepenthes distillatoria* is described as destitute of stomata ; that of the under surface as being furnished with numerous oval, or nearly orbicular stomata, composed of two semicircular cellules with rectilinear faces. That of the outer surface of the pitcher is also without stomata, but covered, especially in the young state, with long subulate hairs, frequently dichotomous, or furnished with a spur-like process at their base. The outer surface of the operculum is sparingly furnished with stomata, and clothed with hairs which are frequently branched and fasciculate ; the inner has no stomata, but is furnished with clathrophores and clothed with hairs, which are often fasciculate, but mostly simple.

In *Sarracenia purpurea* the cuticle of the pitchers is described as consisting of sinuously-lobed and somewhat stelliform cellules, with numerous small, oval, closed stomata. The fibrous bundles are stated to be composed entirely of long pleurenchyma, the parenchyma adjacent to which consists of beautiful spiral cellules. The hairs of the inner surface of the operculum are simple, hollow, reflexed, subulate, and marked with numerous longitudinal parallel lines or striæ ; they proceed from a somewhat elevated base. In the pitchers of *Cephalotus* the stomata are large, oval and closed ; the spiral vessels smaller than in *Nepenthes*, and containing only a single fibre ; and the hairs which form the fringed border are simple, obtuse and transparent.

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The following are the characters of the new genera described in this paper.

Trib. SACCHARINÆ.

LEPTATHERUM, Nees.

Spiculæ in rachi ad articulos barbâ cinctâ geminæ, homogamæ, hemiologamæ, alterâ sessili, alterâ pedicellatâ, utrâque setigerâ. *Glumæ* duæ, herbaceo-membranaceæ, acutæ ; inferior dorso canaliculata, quadri-nervis ; superior carinata trinervis. *Flosculi* univalves membranacei ; inferior neuter, muticus ; superior linearis, canaliculatus, apice trans-

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BATRATHERUM, Nees.

Spiculæ in rachi articulata geminatæ, heterogamæ, alterâ sessili hemigamâ, alterâ pedicellatâ neutrâ. *Glumæ spiculæ* perfectæ 2, subæquales, herbaceo-chartaceæ, acutæ, apiceve acutè bidentatæ, in aliis superior apice setacea; inferior plana, 2—6-nervis; superior carinata, complicata, 1—3-nervis, a dorso plicata, canalem struens, in quo seta flosculi continetur, margine tenui simpliciter connivente. *Flosculi* membranacei, glumis breviores, nunquam saltem longiores; inferior neuter, 1-valvis, muticus; superior bivalvis; valvulâ inferiori acuminatâ apice minutè bidentatâ propè a basi emittente setam in medio geniculatam infernè tortam; superiori exiguâ lineari-subulatâ bidentatâ quandoque nullâ. *Lodiculæ* latæ, membranaceæ, truncatæ, dentatæ, plicatæ, in semicirculo singulæ singulum floris latus ambientes. *Stamina* 3. *Stigmata* villosa. *Styli* discreti. *Spicula* pedicellata angustior, subuniglumis. *Gluma* plana acuta nervosa, margine subtilius serrulata; superior gluma et flosculi rudimentum minuta, rotundata, squamiformia. *Inflorescentia*: *Spica* parçè dichotoma, ad genicula magis minùsve barbata. *Pedicelli spicularum sterili* ciliati.—*Gramina* repentia, ramosa, foliis brevibus amplexicaulibus. *Stipulæ* membranaceæ, exsertæ. *B. micans*, Nees.

APOCOPIS, Nees.

Spiculæ in rachi angustâ barbulatoris subgeminæ muticæ, alterâ rudimentali pedicellari, alterâ polygamâ sessili. *Glumæ* truncatæ; inferior lata, plana, obovato-conica, coriaceo-chartacea, 8—9-nervis, lævis, apice minutè bidentata et inter denticulos subciliolata, basin versus firmior et colorata; superior ovata, apice angustior denticulataque, chartacea, marginibus inflexa, lævis, quinquenervis. *Flosculi* 2, membranacei, bivalves, mutici; inferior masculus valvulis æqualibus, apice truncatis denticulatis, dentibus aliquot magis distantibus. *Stamina* 3, antheris angustis, fulvis. *Lodiculæ* exilissimæ, quandoque omninè nullæ quandoque denticuliformes acutæ. *Flosculus* superior hermaphroditus, vel potiùs hermaphrodito-femineus. *Valvula* inferior paulò firmior reliquis et colorata, apice truncato-bi-tri-denticulato; superior brevior, latiùs truncata, ciliolato-denticulata. *Lodiculæ* nullæ, ant forsan, ut in masculino, exilissimæ. *Stamina* 3, eo tempore quo flosculi masculi stamina antheris perfectissimis filamentisque nondum elongatis intra valvulas adhuc latent, jam maximè extenuatis filamentis antheris autem nullis residuis extra valvulas prominentibus, conspicua. *Ovarium* lanceolatum, in stylum simplicem, mox bifidum, transiens. *Stigmata* longa, linearia, brevi-villosa. *Spiculæ neutrius vestigia* produntur pedicello, spiculæ fertili adjecto, ciliato, mutilo. *Inflorescentia*: *Spica* bifida aut geminata; articulis trigonis ciliato-hirsutis ad genicula longiùs barbulatoris.—*Gramen* tenerum, gracile, ramosum. *Nodi* glabri. *Vaginæ* arctæ. *Folia* plana, lineari-acuta. *A. Royleanus*, Nees.

iens in setam longam capillarem apice subcirrhosam non genuflexam. *Lodiculæ* 2, obconicæ, plicatæ, truncatæ, ovario breviores, membranaceæ. *Stamina* 3, filamentis capillaribus. *Styli* basi conjuncti, graciles; stigmata villosa. *Caryopsis* libera, lanceolata, acuta. *Inflorescentia*: *Spicæ*, rachi continuâ, triangulari, glabrâ, solis spicularum insertionibus barbulatoris, fasciculatæ, laxæ.—*Herba*, habitu Panici Sectionis Digitariarum. *Culmus* racemosus, adscendens. *Vaginæ* longæ. *Folia* lanceolata, acuta, plana, lætè viridia, nervo albo. *Ligula* nulla. *L. Royleanum*, Nees.

BATRATHERUM, Nees.

Spiculæ in rachi articulata geminata, heterogamæ, alterâ sessili hemigamâ, alterâ pedicellatâ neutrâ. *Glumæ spiculæ* perfectæ 2, subæquales, herbaceo-chartaceæ, acutæ, apiceve acutè bidentatæ, in aliis superior apice setacea; inferior plana, 2—6-nervis; superior carinata, complicata, 1—3-nervis, a dorso plicata, canalem struens, in quo seta flosculi continetur, margine tenui simpliciter connivente. *Flosculi* membranacei, glumis breviores, nunquam saltem longiores; inferior neuter, 1-valvis, muticus; superior bivalvis; valvulâ inferiori acuminatâ apice minutè bidentatâ propè a basi emittente setam in medio geniculatam infernè tortam; superiori exiguâ lineari-subulatâ bidentatâ quandoque nullâ. *Lodiculæ* latæ, membranaceæ, truncatæ, dentatæ, plicatæ, in semicirculo singulæ singulum floris latus ambientes. *Stamina* 3. *Stigmata* villosa. *Styli* discreti. *Spicula* pedicellata angustior, subuniglumis. *Gluma* plana acuta nervosa, margine subtilius serrulata; superior gluma et flosculi rudimentum minuta, rotundata, squamiformia. *Inflorescentia*: *Spica* parçè dichotoma, ad genicula magis minùsve barbata. *Pedicelli spicularum sterili* ciliati.—*Gramina* repentia, ramosa, foliis brevibus amplexicaulis. *Stipulæ* membranaceæ, exsertæ. *B. micans*, Nees.

APOCOPIS, Nees.

Spiculæ in rachi angustâ barbulatoris subgeminæ muticæ, alterâ rudimentali pedicellari, alterâ polygamâ sessili. *Glumæ* truncatæ; inferior lata, plana, obovato-conica, coriaceo-chartacea, 8—9-nervis, lævis, apice minutè bidentata et inter denticulos subciliolata, basin versus firmior et colorata; superior ovata, apice angustior denticulataque, chartacea, marginibus inflexa, lævis, quinquenervis. *Flosculi* 2, membranacei, bivalves, mutici; inferior masculus valvulis æqualibus, apice truncatis denticulatis, dentibus aliquot magis distantibus. *Stamina* 3, antheris angustis, fulvis. *Lodiculæ* exilissimæ, quandoque omninè nullæ quandoque denticuliformes acutæ. *Flosculus* superior hermaphroditus, vel potiùs hermaphrodito-femineus. *Valvula* inferior paulò firmior reliquis et colorata, apice truncato-bi-tri-denticulato; superior brevior, latiùs truncata, ciliolato-denticulata. *Lodiculæ* nullæ, ant forsan, ut in masculino, exilissimæ. *Stamina* 3, eo tempore quo flosculi masculi stamina antheris perfectissimis filamentisque nondum elongatis intra valvulas adhuc latent, jam maximè extenuatis filamentis antheris autem nullis residuis extra valvulas prominentibus, conspicua. *Ovarium* lanceolatum, in stylum simplicem, mox bifidum, transiens. *Stigmata* longa, linearia, brevi-villosa. *Spiculæ neutrius vestigia* produntur pedicello, spiculæ fertili adjecto, ciliato, mutilo. *Inflorescentia*: *Spica* bifida aut geminata; articulis trigonis ciliato-hirsutis ad genicula longiùs barbulatoris.—*Gramen* tenerum, gracile, ramosum. *Nodi* glabri. *Vaginæ* arctæ. *Folia* plana, lineari-acuta. *A. Royleanus*, Nees.

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BATRATHERUM, Nees.

Spiculæ in rachi articulata geminatæ, heterogamæ, alterâ sessili hemigamâ, alterâ pedicellatâ neutrâ. *Glumæ spiculæ* perfectæ 2, subæquales, herbaceo-chartaceæ, acutæ, apiceve acutè bidentatæ, in aliis superior apice setacea; inferior plana, 2—6-nervis; superior carinata, complicata, 1—3-nervis, a dorso plicata, canalem struens, in quo seta flosculi continetur, margine tenui simpliciter connivente. *Flosculi* membranacei, glumis breviores, nunquam saltem longiores; inferior neuter, 1-valvis, muticus; superior bivalvis; valvulâ inferiori acuminatâ apice minutè bidentatâ propè a basi emittente setam in medio geniculatam infernè tortam; superiori exiguâ lineari-subulatâ bidentatâ quandoque nullâ. *Lodiculæ* latæ, membranaceæ, truncatæ, dentatæ, plicatæ, in semicirculo singulæ singulum floris latus ambientes. *Stamina* 3. *Stigmata* villosa. *Styli* discreti. *Spicula* pedicellata angustior, subuniglumis. *Gluma* plana acuta nervosa, margine subtilius serrulata; superior gluma et flosculi rudimentum minuta, rotundata, squamiformia. *Inflorescentia*: *Spica* parçè dichotoma, ad genicula magis minùsve barbata. *Pedicelli spicularum sterili* ciliati.—*Gramina* repentia, ramosa, foliis brevibus amplexicaulibus. *Stipulæ* membranaceæ, exsertæ. *B. micans*, Nees.

APOCOPIS, Nees.

Spiculæ in rachi angustâ barbulatoris subgeminæ muticæ, alterâ rudimentali pedicellari, alterâ polygamâ sessili. *Glumæ* truncatæ; inferior lata, plana, obovato-conica, coriaceo-chartacea, 8—9-nervis, lævis, apice minutè bidentata et inter denticulos subciliolata, basin versus firmior et colorata; superior ovata, apice angustior denticulataque, chartacea, marginibus inflexa, lævis, quinquenervis. *Flosculi* 2, membranacei, bivalves, mutici; inferior masculus valvulis æqualibus, apice truncatis denticulatis, dentibus aliquot magis distantibus. *Stamina* 3, antheris angustis, fulvis. *Lodiculæ* exilissimæ, quandoque omninè nullæ quandoque denticuliformes acutæ. *Flosculus* superior hermaphroditus, vel potiùs hermaphrodito-femineus. *Valvula* inferior paulò firmior reliquis et colorata, apice truncato-bi-tri-denticulato; superior brevior, latiùs truncata, ciliolato-denticulata. *Lodiculæ* nullæ, ant forsan, ut in masculino, exilissimæ. *Stamina* 3, eo tempore quo flosculi masculi stamina antheris perfectissimis filamentisque nondum elongatis intra valvulas adhuc latent, jam maximè extenuatis filamentis antheris autem nullis residuis extra valvulas prominentibus, conspicua. *Ovarium* lanceolatum, in stylum simplicem, mox bifidum, transiens. *Stigmata* longa, linearia, brevi-villosa. *Spiculæ neutrius vestigia* produntur pedicello, spiculæ fertili adjecto, ciliato, mutilo. *Inflorescentia*: *Spica* bifida aut geminata; articulis trigonis ciliato-hirsutis ad genicula longiùs barbulatoris.—*Gramen* tenerum, gracile, ramosum. *Nodi* glabri. *Vaginæ* arctæ. *Folia* plana, lineari-acuta. *A. Royleanus*, Nees.

Trib. STIPEÆ.

ORTHORAPHIUM, Nees.

Spiculæ unifloræ. *Glumæ* duæ convexæ, chartaceo-membranaceæ, plurinerves. *Flosculus* collo barbato hinc depresso-plano insertus, bivalvis, chartaceus. *Valvula* inferior plurinervis, convoluta, apice attenuata in subulam continuam non articulata neque contortam; superior brevior, binervis, dorso convexa. *Lodiculæ* 3, membranaceæ; duæ anteriores lanceolatae, ovarium æquantes, basi callo insertæ; posterior lanceolato-linearis, ovario duplò longior. *Stamina* 3, antheræ flavæ, apice barbata aut nudæ. *Ovarium* sessile, apice calloso-incrassatum. *Styli* breves, basi contigui. *Stigmata* plumosa. *Caryopsis* libera. *Inflorescentia*: *Panicula* angusta, ramis paucifloris.—*Gramina* foliis angustis rigidis, caudâ aristæformi spicularum mediocri rigidulâ scabrâ. *O. Roylei*, Nees.

Trib. CHLORIDEÆ.

MELANOCENCHRIS, Nees.

Spiculæ sesquifloræ aut subtrifloræ, flosculo extremo rudimentali, in rachi propriâ brevi alternæ quidem, sed adeò approximatae ut capitulum involucrem exhibeant; superiores rachillæ imperfectæ. *Glumæ* in infimis duæ, æquales, in superioribus quandoque in omnibus una (supera), bractææformes, subulatae, rigidæ, hirsutæ, flosculis longiores, basi membranaceo-marginatæ. *Flosculi* perfecti duo, ubi gluma singula residet quasi axillares in angulo glumæ et rachillæ; quorum alter rachillæ propior, hermaphroditus, perfectus, sessilis; alter masculus vel neuter pedicellatus; tertius, ubi adest, rudimentalis, clavatus, nudo pedicello seu rachillæ apice indicatus. *Valvulae* duæ, membranaceo-herbaceæ; inferior trinervis, apice bifida, laciniis æqualibus lineari-subulatis, vel bifida cum setâ interjectâ; superior æquè longa, plana, binervis, apice bifida. *Flosculus* superior conformis, sed minor. *Lodiculæ* breves, subquadratae, bidentatae, glabræ. *Stamina* 3. *Antheræ* luteæ. *Ovarium* oblongum, compressum, læve, truncatulum. *Styli* longi, latè discreti, filiformes. *Stigmata* angusta, dissitè brevi-puberula. *Caryopsis* libera. *Inflorescentia*: *Spicæ* partiales, formâ involucrorum Cenchri aut Penniseti, in rachi communi flexuosâ alternæ, secundæ, paucæ, nutantes racemulum exhibent.—*Gramina* perennia, parva, polyphylla, ramosa. *Folia* brevina, rigidula. *Ligula* nulla. *Racemus* exsertus, gracilis, secundus, latus. *Setæ* flosculorum coloratæ.

1. *M. Royleana*, Nees.

2. *M. Rothiana*, Nees.

Pomereulla monoica, Roth.

Trib. FESTUCEÆ.

PLAGIOLYTRUM, Nees.

Spicula multiflora. *Glumæ* duæ, spiculâ breviores; inferior minor amplectens, obliquè acutata, altero latere subpræmorsa; superior bidentata, et inter dentes brevi-subulata, subulâ dentes æquante, e nervi dorsalis geminati apice unito ortâ. *Flosculi* in axi gracili ad genicula barbulata imbricati, bivalves. *Valvula* inferior ovata, lateribus incurva, herbacea, trinervis, apice bilaciniata laciniis muticis, setis tribus strictis, e nervo medio duobusque lateralibus proficiscentibus interjectis; superior oblonga, magis membranacea, sursùm plana, in apice obtusiusculo bifida, inferiùs convoluta, referens flosculum ligulatum Synan-

Trib. STIPEÆ.

ORTHORAPHIUM, Nees.

Spiculæ unifloræ. *Glumæ* duæ convexæ, chartaceo-membranaceæ, plurinerves. *Flosculus* collo barbato hinc depresso-plano insertus, bivalvis, chartaceus. *Valvula* inferior plurinervis, convoluta, apice attenuata in subulam continuam non articulata neque contortam; superior brevior, binervis, dorso convexa. *Lodiculæ* 3, membranaceæ; duæ anteriores lanceolatae, ovarium æquantes, basi callo insertæ; posterior lanceolato-linearis, ovario duplò longior. *Stamina* 3, antheræ flavæ, apice barbata aut nudæ. *Ovarium* sessile, apice calloso-incrassatum. *Styli* breves, basi contigui. *Stigmata* plumosa. *Caryopsis* libera. *Inflorescentia*: *Panicula* angusta, ramis paucifloris.—*Gramina* foliis angustis rigidis, caudâ aristæformi spicularum mediocri rigidulâ scabrâ. *O. Roylei*, Nees.

Trib. CHLORIDEÆ.

MELANOCENCHRIS, Nees.

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1. *M. Royleana*, Nees.

2. *M. Rothiana*, Nees.

Pomereulla monoica, Roth.

Trib. FESTUCEÆ.

PLAGIOLYTRUM, Nees.

Spicula multiflora. *Glumæ* duæ, spiculâ breviores; inferior minor amplectens, obliquè acutata, altero latere subpræmorsa; superior bidentata, et inter dentes brevi-subulata, subulâ dentes æquante, e nervi dorsalis geminati apice unito ortâ. *Flosculi* in axi gracili ad genicula barbulata imbricati, bivalves. *Valvula* inferior ovata, lateribus incurva, herbacea, trinervis, apice bilaciniata laciniis muticis, setis tribus strictis, e nervo medio duobusque lateralibus proficiscentibus interjectis; superior oblonga, magis membranacea, sursùm plana, in apice obtusiusculo bifida, inferiùs convoluta, referens flosculum ligulatum Synan-

Trib. STIPEÆ.

ORTHORAPHIUM, Nees.

Spiculæ unifloræ. *Glumæ* duæ convexæ, chartaceo-membranaceæ, plurinerves. *Flosculus* collo barbato hinc depresso-plano insertus, bivalvis, chartaceus. *Valvula* inferior plurinervis, convoluta, apice attenuata in subulam continuam non articulatam neque contortam; superior brevior, binervis, dorso convexa. *Lodiculæ* 3, membranaceæ; duæ anteriores lanceolatae, ovarium æquantes, basi callo insertæ; posterior lanceolato-linearis, ovario duplò longior. *Stamina* 3, antheræ flavæ, apice barbata aut nudæ. *Ovarium* sessile, apice calloso-incrassatum. *Styli* breves, basi contigui. *Stigmata* plumosa. *Caryopsis* libera. *Inflorescentia*: *Panicula* angusta, ramis paucifloris.—*Gramina* foliis angustis rigidis, caudâ aristæformi spicularum mediocri rigidulâ scabrâ. *O. Roylei*, Nees.

Trib. CHLORIDEÆ.

MELANOCENCHRIS, Nees.

Spiculæ sesquifloræ aut subtrifloræ, flosculo extremo rudimentali, in rachi propriâ brevi alternæ quidem, sed adeò approximatae ut capitulum involucrem exhibeant; superiores rachillæ imperfectæ. *Glumæ* in infimis duæ, æquales, in superioribus quandoque in omnibus una (supera), bractææformes, subulatae, rigidæ, hirsutæ, flosculis longiores, basi membranaceo-marginatæ. *Flosculi* perfecti duo, ubi gluma singula residet quasi axillares in angulo glumæ et rachillæ; quorum alter rachillæ propior, hermaphroditus, perfectus, sessilis; alter masculus vel neuter pedicellatus; tertius, ubi adest, rudimentalis, clavatus, nudo pedicello seu rachillæ apice indicatus. *Valvulae* duæ, membranaceo-herbaceæ; inferior trinervis, apice bifida, laciniis æqualibus lineari-subulatis, vel bifida cum setâ interjectâ; superior æquè longa, plana, binervis, apice bifida. *Flosculus* superior conformis, sed minor. *Lodiculæ* breves, subquadratae, bidentatae, glabræ. *Stamina* 3. *Antheræ* luteæ. *Ovarium* oblongum, compressum, læve, truncatulum. *Styli* longi, latè discreti, filiformes. *Stigmata* angusta, dissitè brevi-puberula. *Caryopsis* libera. *Inflorescentia*: *Spicæ* partiales, formâ involucrem Cenchri aut Penniseti, in rachi communi flexuosâ alternæ, secundæ, paucæ, nutantes racemulum exhibent.—*Gramina* perennia, parva, polyphylla, ramosa. *Folia* brevina, rigidula. *Ligula* nulla. *Racemus* exsertus, gracilis, secundus, laxus. *Setæ* flosculorum coloratæ.

1. *M. Royleana*, Nees.

2. *M. Rothiana*, Nees.

Pomereulla monoica, Roth.

Trib. FESTUCEÆ.

PLAGIOLYTRUM, Nees.

Spicula multiflora. *Glumæ* duæ, spiculâ breviores; inferior minor amplectens, obliquè acutata, altero latere subpræmorsa; superior bidentata, et inter dentes brevi-subulata, subulâ dentes æquante, e nervi dorsalis geminati apice unito ortâ. *Flosculi* in axi gracili ad genicula barbulata imbricati, bivalves. *Valvula* inferior ovata, lateribus incurva, herbacea, trinervis, apice bilaciniata laciniis muticis, setis tribus strictis, e nervo medio duobusque lateralibus proficiscentibus interjectis; superior oblonga, magis membranacea, sursùm plana, in apice obtusiusculo bifida, inferiùs convoluta, referens flosculum ligulatum Synan-

thereæ, subquadrinervis, nervis duobus marginibus proximis distinctis, mediis obsoletis. *Lodiculæ* 2, coloratæ, conicæ, truncatæ, glabræ, angustæ. *Stamina* 2 (?). *Filamenta* capillaria. *Ovarium* cylindricum, glabrum. *Styli* filiformes, distantes. *Stigmata* laxè villosa. *Caryopsis* elongato-cylindrica, compressiuscula, truncato-bidenticulata. *Inflorescentia*: *Spica* simplex, disticho-subsecunda.—*Gramina* erecta, foliis angustis, ligulâ brevi.

1. *P. calycinum*, Nees.
Dineba calycina, *Hb. Wight*.
2. *P. filiforme*, Nees.
3. *P. unidentatum*, Nees.

Many new species belonging to genera previously established are also characterized and described.

February 16.—The Bishop of Norwich, President, in the Chair.

Read "Observations on some new or little-known species of *Polyparia*, found in the supercretaceous strata of Italy." By Signor Giovanni Michelotti of Turin.

March 2.—Mr. Forster, V.P., in the Chair.

Read a "Description of a new genus of Plants from Brazil." By John Miers, Esq., F.L.S.

The following are the characters of the new genus described:—

TRIURIS.

Flores dioici. *Perianthii foliola* 3, obovata, infra apicem processu longo instructa. ♂ *Antheræ* 3? sessiles, loculis disjunctis, imo androphoro magno carnoso centrali insertæ. ♀ *Pistilla* numerosissima, aggregata, supra. *Styli* simplices, subulati. *Fructus* ignotus.—*Planta pusilla hyalina*, foliis paucis bracteiformibus.

T. hyalina.

Hab. in humidis Serra dos Orgãos Provinciæ Rio de Janeiro.

Mr. Miers observed this minute plant only in a single locality, and was unable to find ripe fruit. He perceived, however, in each pistillum what appeared to him to be a solitary ovule, but so minute and indistinct as to be evident only by the appearance of a darker oval form in the centre. He has consequently no positive evidence whether it is Monocotyledonous or Dicotyledonous; but is induced by various considerations to refer it to the former class. He notices the points in which it appears to him to bear some resemblance to different Monocotyledonous families, and suggests that, as it cannot be distinctly referred to any of them, it may probably be taken as the type of a distinct order, holding a place between *Burmanniaceæ* and *Fluviales*.

The processes which are noticed in the character as arising from below the apices of the divisions of the perianthium, are described as capillary tubes three times as long as the segments, within which they are coiled up during æstivation, their apices exhibiting at the apex of the bud three minute pore-like apertures open externally.

thereæ, subquadrinervis, nervis duobus marginibus proximis distinctis, mediis obsoletis. *Lodiculæ* 2, coloratæ, conicæ, truncatæ, glabræ, angustæ. *Stamina* 2 (?). *Filamenta* capillaria. *Ovarium* cylindricum, glabrum. *Styli* filiformes, distantes. *Stigmata* laxè villosa. *Caryopsis* elongato-cylindrica, compressiuscula, truncato-bidenticulata. *Inflorescentia*: *Spica* simplex, disticho-subsecunda.—*Gramina* erecta, foliis angustis, ligulâ brevi.

1. *P. calycinum*, Nees.
Dineba calycina, *Hb. Wight*.
2. *P. filiforme*, Nees.
3. *P. unidentatum*, Nees.

Many new species belonging to genera previously established are also characterized and described.

February 16.—The Bishop of Norwich, President, in the Chair.

Read "Observations on some new or little-known species of *Polyparia*, found in the supercretaceous strata of Italy." By Signor Giovanni Michelotti of Turin.

March 2.—Mr. Forster, V.P., in the Chair.

Read a "Description of a new genus of Plants from Brazil." By John Miers, Esq., F.L.S.

The following are the characters of the new genus described:—

TRIURIS.

Flores dioici. *Perianthii foliola* 3, obovata, infra apicem processu longo instructa. ♂ *Antheræ* 3? sessiles, loculis disjunctis, imo androphoro magno carnoso centrali insertæ. ♀ *Pistilla* numerosissima, aggregata, supra. *Styli* simplices, subulati. *Fructus* ignotus.—*Planta pusilla hyalina*, foliis paucis bracteiformibus.

T. hyalina.

Hab. in humidis Serra dos Orgãos Provinciæ Rio de Janeiro.

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GEOLOGICAL SOCIETY.

March 11, 1840.—A paper was read, "On the Siliceous Bodies of the Chalk, Greensand and Oolites;" by Mr. Bowerbank, F.G.S.

The author commences by stating, that naturalists and geologists have long considered the form of tuberos masses of flint found in the upper chalk to be due to alcyonia or sponges, but that he is not aware of this opinion having been proved to be correct. It was Professor Ehrenberg's observations on siliceous bodies which first induced him to obtain thin slices of flint with the intention of procuring specimens of Xanthidium. In the examination of these slices, he was struck with the frequent occurrence of patches of brown, reticulated tissue, spicula and Foraminifera, and he was induced to infer, that the patches of tissue were the remains of the organized body, possibly a sponge, to which the flint owed its form. With this belief, he commenced his inquiries by examining thin slices of flints obtained from various localities, and he found in all of them a perfect accordance in the structure and proportion of reticulated tissue, in the number of spicula, and in the occurrence of Xanthidia and Foraminifera. The following are the general appearances which the slices of flint exhibit when mounted upon glass.

With a power of about 120 linear, the slice presents the appearance of a stratum of a turbid solution of decomposed vegetable or animal matter containing Foraminifera, spicula, Xanthidia, and frequently fragments of the brown tissue. In a specimen from Northfleet the mass of the spongy portion exhibited numerous cylindrical contorted canals, which from their uniformity and minuteness of diameter, Mr. Bowerbank considered to be the incurrent canals of the sponge; and other orifices of greater diameter to be the excurrent. Very frequently, when little of the reticulated substance of the sponge remains, its former presence, the author says, is indicated by the siliceous matter resembling a congeries of gelatinous globules, moulded by the tissue amid which it was deposited; and the globules, when traced to the edges of the patches of spongy texture, were found to agree in size and form with the orifices of the supposed incurrent canals. In cases where no traces of the sponge can be detected, Mr. Bowerbank thinks, that the mode in which the spicula, Foraminifera and other extraneous matters are dispersed equally in all parts, and not precipitated to one portion of the flint, indicates that the organized tissue in which they were entangled, retained its form and texture sufficiently long to allow of the fossilization of these remains in their original places; and that the nature and position of these bodies strongly indicated the former spongy nature of the flint.

When the chalk is carefully washed from the exterior of a flint, and a portion examined as an opaque object with a power of about fifty linear, it exhibits a peculiar saccharine appearance, with deep circular excavations, having fragments of extraneous matters partly imbedded or adhering to them. If the surface be further cleansed by immersion in diluted muriatic acid, till effervescence ceases, spicula may be detected on the sides of the deep circular cavities; and if,

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again, a piece a quarter of an inch in diameter, presenting the roughest aspect, be examined under a power of 120 linear, illuminated by a Lieberkuhn, the surface, under favourable circumstances, will present a complex mass of small, contorted tubuli, occasionally furnished at the apex with a minute perforation.

The structure and other characters of the tabular flints are stated to accord perfectly with those of the nodular masses, except that the under surface has a still more marked spongy aspect, and that spicula and Foraminifera are more abundant. The absence of any apparent base or point of attachment in the great mass of nodular chalk flints, the author says (considering them undoubtedly of spongy origin), may be accounted for by supposing that the gemmule was originally attached to some minute fragment of a shell or other substance, and that its further development took place while recumbent on the mud or silt.

The perpendicular and oblique veins of flint between Brighton and Rottingdean, are reported to present exactly the same internal characters as the tabular and nodular flints, and to agree externally with the former. The occasional existence of a fissure filled with chalk, in the centre of the vertical layers, Mr. Bowerbank conceives, may indicate that the sponge had grown from the two sides of the crevices, but had not in all places been able to unite. The sides of these flint veins are not studded with Foraminifera in a manner similar to that of the tabular horizontal layers.

Mr. Bowerbank next examined the flint with which Echinites and shells of the chalk are often entirely or partially filled and enveloped, and he states, that the results were the same, both with reference to the exterior and the interior of the flint. In those cases in which the Echinite is only partially filled, he infers that the portion so occupied was originally a sponge, because its surface is uneven; for had the flint been deposited in an empty shell or Echinite, it would present an uniformly flat surface. Again, he states, that the projecting of the flint through the two openings of the Echinite, with an extension to a greater or less distance, is owing to the sponge having grown outwards through these orifices; and the envelopment of an organic body by a tabular mass of flint, he explains by reference to the habit of recent sponges to invest testacea or other marine bodies. In some cases, he has found minute but deep depressions on the surface of flints filling Galerites, and immediately opposite to the ambulacral pores; and he ascribes the origin of the depressions to streams of water drawn in through the orifices to supply the wants of the living sponge.

Mr. Bowerbank was afterwards induced to extend his examination to the flints which invest the zoophytic bodies of the Wiltshire chalk. By carefully cleaning the interior of some of these flints, he discovered spicula projecting from all parts, however different the character of the inclosed body; and the spicula appeared to have no reference to it, none of them being found on its surface. Under the microscope, the investing flint presented in every respect the same appearance as that exhibited on the lower surface of the tabular flints, ha-

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A comparison of the characters presented by the spongy remains of the flint, with a collection of recent sponges, has induced Mr. Bowerbank to conclude that the fossils cannot be referred to any of the established divisions of existing sponges.

On examining the cherts of the greensand of Fovant in Wiltshire in the same manner, he found that the only differences between them and chalk flints, existed in the coarser texture of the spongy fibre, the greater size of the interstices of the network, and the larger dimensions of the imbedded extraneous bodies. The cherty nodules of the upper greensand of Shaftesbury afforded similar appearances. A black, semi-transparent nodule, with an outer coat resembling agglutinated sand, was found under the microscope to contain numerous contorted canals of various sizes, and a considerable number of beautiful green spicula. Two chert casts of *Spatangi* from Shaftesbury afforded results analogous to those obtained from chalk *Echinites*.

Slices from a great variety of the greensand cherts of Lyme Regis presented characters which agreed with the cherts of Fovant. A specimen of flint from the Portland stone of Tisbury, and another from Portland, gave a greater quantity of cellular structure than any of the previously noticed cases, and the texture bore a greater affinity to that of the freshwater sponge, than is exhibited in the flints of the chalk or the cherts of the green sand.

With respect to the causes of the deposition of the flint, Mr. Bowerbank objects to the supposition, that it was influenced by the siliceous spicula of the sponges, because the flint is in no case limited or determined by their immediate presence, but is, in all instances, bounded by the extent of the animal matter of the sponge. He has frequently observed that the large excurrent canals in the chalk-flint spongyites are not filled with siliceous matter, and that the spicula projecting into them have not the slightest incrustation of siliceous matter upon their surface; while on the contrary, wherever a single tube or a thin layer of tubes has been projected from the mass into the chalk, the siliceous matter has been attracted to it. He conceives also, that the retention of the spicula and extraneous matters in all parts of the flint, may be accounted for, by supposing that the animal matter was the attractive agent, acting equally throughout the whole body of the sponge. In support of his argument he adduces the siliceous shells of Blackdown, and the siliceous corals of the Tisbury oolite and the mountain limestone, which contain no spicula, and in which it cannot be supposed that previously existing siliceous matter was the attractive agent. Lastly, the pyritous fossils of the London, Kimmeridge, Oxford and other clays, are also mentioned as examples of animal and vegetable substances having exercised an attractive influence.

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ZOOLOGICAL SOCIETY.

August 11, 1840.—R. C. Griffith, Esq., in the Chair.

A paper entitled "Description of Shells collected and brought to this country by Hugh Cuming, Esq.," by W. J. Broderip, Esq., F.R.S., etc., was read.

"Mr. Cuming," observes the author, "the fruits of whose western voyage are so well known, left England on the 26th of February, 1836; he proceeded to the Philippine Islands, by the permission of the Queen Regent of Spain, and aided by powerful recommendations from her government, which opened to him the interior of the islands, and caused him to be received with a noble hospitality, equalled only by the warm interest which facilitated his pursuits wherever he arrived and made himself known.

"Mr. Cuming visited the whole group. His longest stay was in the island of Luzon, fifteen provinces of which were well ransacked by him. In the islands Mindoro, Negros, Panay, Siquijod, Zebu, Bohol, Camiguin, Mindanao, Leyte, Samar, Capul, Ticao, Masbate, Burias, Temple, Marinduque, Maracavan, and Ramblon, he reaped a fine harvest. He left the Philippines in November, 1839, proceeded thence to Singapore and Malacca, and returned to England in June, 1840, bringing with him, besides the living animals which he has liberally presented to this Society, a grand collection of zoological and botanical specimens, including more than three thousand species and varieties of shells, the greater part of which appear to be new to science, and among them are several new genera. The smaller islands were particularly rich in the pulmoniferous mollusca, which were found by Mr. Cuming principally in deep forests. We commence a notice of the labours of this active and zealous collector, with an attempt to describe a few of these terrestrial species. Mr. G. B. Sowerby, who liberally gives up his valuable time to assist in laying before the public the novelties of this part of the collection, will also begin his share of the task, by describing another branch of the same numerous family; and it is intended to submit descriptions to the Society from time to time till the whole of Mr. Cuming's stores are exhausted.

"Before, however, we commence our task, I must, in justice to him who has placed the materials in our hands, observe, that, to say nothing of the variety of new forms which he has been the means of bringing to light, those who cultivate this branch of zoology so highly interesting to the geologist, as well as the physiologist, owe him a large debt of gratitude, for information on a point of no small zoological importance. It is not very long since, that the localities ascribed to shells could in very few instances be depended upon. The cupidity of dealers, some years ago, not unfrequently prompted them wilfully to deceive those who gave extravagant prices for new shells on this point, and carelessness was generally the order of the day. Mr. Cuming, by his accurate notes, and the open publication of the places where every one of the multitudinous species and varieties collected by him was found, has mainly assisted in making a

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complete revolution in this department of the science, and has done more towards giving us data for the geographical distribution of the testaceous mollusca than any person who has yet lived.

“HELICIDÆ.

“When we consider what the genus *Helix* was when Linnæus wrote, and what it now is, we must be struck with the flood of new species which has been poured in upon us of late years. Already the vocabulary has been so drawn upon, that the mere finding names for the new species is attended with no small embarrassment, whilst the limits of each species are daily more difficult to fix. When a few forms only in a great natural group are known, they are easily defined. It is where multitudes are placed before the zoologist, marked with every variation that food and temperature and locality can impress upon them, that it becomes no longer easy to solve the problem, ‘Which is a species and which is a variety?’ Then it is that the pregnant question ‘What is a species?’ comes home to the mind. But our business now is to define, as well as we can, those forms which have been laid before us, and which, to us at least, are new. When the whole of the additions to this great tribe existing in Mr. Cuming’s collection have been studied, we shall perhaps have materials for something like a complete natural arrangement of the group.”

Genus BULINUS*.

BULINUS MINDOROENSIS. *Bul. testâ ovatâ, ventricosâ, subprondâ, anfractibus sex, ultimo longè maximo, lineis incrementi oblique striatâ, aperturâ subrotundâ, columellâ latâ, labio expanso.*

Var. *a. valdè ventricosa, sordidè brunnea strigis irregularibus longitudinalibus varia; aperturâ subalbâ; labio nigro-brunnescente.*

Hab. ad Puerto Galero in insulâ Philippinâ Mindoro dictâ.

Legit H. Cuming in sylvis.

Var. *b. Pallidior, coloribus distinctioribus, fasciâ suturali brunneâ interruptâ; anfractu ultimo fasciâ brunneâ strigis longitudinalibus interruptâ cincto; labii margine castaneo-rufescente.*

Hab. ad Mansilai in insulâ Mindoro.

Legit H. Cuming in sylvis.

Var. *c. Gracilior, longitudinaliter brunneo et flavo sordido striata.*

This comes very near in colouring, and approaches somewhat in the shape of the aperture, to the two first varieties of *Bul. chrysaliiformis*. The markings of the young shell remind the observer of the eggs of some of the Plovers, and the shape assists the delusion.

Hab. ad Puerto Galero in insulâ Mindoro.

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A brilliant *chatoyant* reflection, like Labradorite, is to be observed on the polished surface of the dark brown reflected part of the outer lip in fresh specimens.

Var. *e. Subnana, gracilior, strigis et coloribus distinctioribus, clarioribus.*

Hab. ad Puerto Galero.

Legit H. Cuming in sylvis.

This variety was the most abundant, and Mr. Cuming informs me that he detected it in the act of depositing its eggs on the leaves of trees in the forest where it was feeding. The eggs, which are white, oblong, and covered with a hard, granular shell, were attached to the leaves by a gummy substance. They are half an inch long, and nearly four-twelfths across in their widest part.

Var. *f. Anfractu ultimo nigrescente, anticè flavo subsordido strigata vel maculata, fasciâ nigrescente basali.*

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In this variety, the abrupt termination of the yellowish markings toward the basal portion of the body-whorl leaves the dark colour almost uninterrupted, in the shape of a dark band.

Var. *g. Strigis distantibus, anfractu basali erga basin cincturâ moniliformi, interruptâ, albâ vel flavescente ornato.*

Hab. ad Mansalai in insulâ Mindoro.

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Var. *h. Pallida, strigis latis, anfractu ultimo fasciâ pallidiori subbasali cincto.*

Hab. ad Mansalai.

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Var. *i. Strigis irregularibus, angulatis, frequentibus tota picta.*

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Var. *k. Cinereo-subvirescens, strigis pallidis angulatis, distantibus, brunneo-marginatis obscurè ornata, anfractu basali fasciâ brunneo-rufescente subbasali cincto.*

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Near the *umbilicus*, the *epidermis*, in those specimens of var. *k.* which I have seen, is worn off, exposing the rich red-brown ground colour of the shell. Indeed in all the varieties the dark colour generally appears to reside in the shell itself, and the lighter-coloured markings, with few, if any exceptions, in the *epidermis*. In the largest variety (*a*) here described, the effect of the detrition of the *epidermis* is well shown. Var. *k.* comes very close upon var. *c.* of *Bulinus chrysalidiformis*. The length of this species is 6 inches and under, and the breadth from about 1 to $1\frac{1}{8}$ of an inch.

BULINUS CHRYSALIDIFORMIS. *Bul. testâ valdè productâ, subpupiformi, subcylindricâ, lineis incrementi obliquè rugosâ; aperturâ subauriculiformi, distortâ; columellâ subrectâ, amplâ, complanatâ;*

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peristomate interrupto; labio interno expanso, labio externo expanso, subrecurvo, sæpiùs subconstricto; umbilico subobsoleto.

Var. *a. Subgracilis, anfractibus 7 subventricosis, ultimo vix subventricosiori; pallidè castanea vel brunnescens strigis longitudinalibus, irregularibus sordidè flavis picta; aperturâ intus subalbida; labio nigro-purpurascente.*

This variety is curiously marked. In the young shells the colours are more pure and distinct, but as the animal becomes aged they are more confused, and run into each other. In both states the upper whorls are transparent, and the two last opaque.

Var. *b. Pallidior, labio haud constricto, ex albido dilutè purpurascente.*

Hab. ad Puerto Galero.

Legit H. Cuming in sylvis.

The distortion and a shade of the constriction may be traced in the mouth of this variety.

Var. *a. et b.* habitant ad Puerto Galero.

Legit H. Cuming in sylvis.

Var. *c. subflava, anfractibus ventricosioribus, fasciâ suturali albida et subpurpureâ tessellatâ; aperturâ amplâ, albâ, labii margine castaneo-purpurascente.*

The shells of this variety are much less thick than those of the two first, and are nearly transparent throughout; but it must be remembered that all which I have seen of this variety appear to be younger shells: the body-whorl is also much more ventricose in proportion.

Var. *d. Tota flavescens, labio albo.*

This variety, as well as the last, when held against the light, shows shadings of the longitudinal stripes.

Var. *c. et d.* habitant ad Mansalai.

Legit H. Cuming in sylvis.

*** *Bulinus chrysalidiformis* of G. B. Sowerby (Zool. Proc. 1833, p. 37) is a faded shell of var. *c.* or *d.* It is without *epidermis*, and entirely white, except the margin of the lip, which is brownish. The length of this species varies from $2\frac{7}{8}$ ths inches to $2\frac{3}{8}$ ths, and the breadth from $1\frac{5}{8}$ ths to $1\frac{1}{8}$ th.

"The shells which I have here attempted to describe were collected by Mr. Cuming in deep and dark forests of thick foliage, some upon, and others beneath, the leaves of trees. There were no palms in these forests.

"I cannot quit this group without acknowledging that I am not without doubts as to the specific difference of *Bul. chrysalidiformis* and *Bul. Mindoroensis*. If the shells at the greater intervals be taken, they appear to be distinct, but there are gradations in these numerous and motley Mindoro snails, that at least closely approximate the two sections into which I have divided them."—W. J. B.

Mr. Cuming exhibited the various species and varieties of shells described in the foregoing paper, and also a series to illustrate the

peristomate interrupto; labio interno expanso, labio externo expanso, subrecurvo, sæpiùs subconstricto; umbilico subobsoleto.

Var. *a. Subgracilis, anfractibus 7 subventricosis, ultimo vix subventricosiori; pallidè castanea vel brunnescens strigis longitudinalibus, irregularibus sordidè flavis picta; aperturâ intus subalbida; labio nigro-purpurascente.*

This variety is curiously marked. In the young shells the colours are more pure and distinct, but as the animal becomes aged they are more confused, and run into each other. In both states the upper whorls are transparent, and the two last opaque.

Var. *b. Pallidior, labio haud constricto, ex albido dilutè purpurascente.*

Hab. ad Puerto Galero.

Legit H. Cuming in sylvis.

The distortion and a shade of the constriction may be traced in the mouth of this variety.

Var. *a. et b. habitant ad Puerto Galero.*

Legit H. Cuming in sylvis.

Var. *c. subflava, anfractibus ventricosioribus, fasciâ suturali albida et subpurpureâ tessellatâ; aperturâ amplâ, albâ, labii margine castaneo-purpurascente.*

The shells of this variety are much less thick than those of the two first, and are nearly transparent throughout; but it must be remembered that all which I have seen of this variety appear to be younger shells: the body-whorl is also much more ventricose in proportion.

Var. *d. Tota flavescens, labio albo.*

This variety, as well as the last, when held against the light, shows shadings of the longitudinal stripes.

Var. *c. et d. habitant ad Mansalai.*

Legit H. Cuming in sylvis.

*** *Bulinus chrysalidiformis* of G. B. Sowerby (Zool. Proc. 1833, p. 37) is a faded shell of var. *c.* or *d.* It is without *epidermis*, and entirely white, except the margin of the lip, which is brownish. The length of this species varies from $2\frac{7}{8}$ ths inches to $2\frac{3}{4}$ ths, and the breadth from $1\frac{5}{8}$ ths to $1\frac{1}{4}$ th.

"The shells which I have here attempted to describe were collected by Mr. Cuming in deep and dark forests of thick foliage, some upon, and others beneath, the leaves of trees. There were no palms in these forests.

"I cannot quit this group without acknowledging that I am not without doubts as to the specific difference of *Bul. chrysalidiformis* and *Bul. Mindoroensis*. If the shells at the greater intervals be taken, they appear to be distinct, but there are gradations in these numerous and motley Mindoro snails, that at least closely approximate the two sections into which I have divided them."—W. J. B.

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memoir of G. B. Sowerby, Esq., which was next read : it is entitled "Descriptions of new species of the family of *Helicidae*, collected by Mr. H. Cuming in the Philippine Islands."

HELIX (COCHLOGENA De F.) POLYCHROA. *Hel. testâ obovatâ, tenui, nitidâ, anfractibus quinque, primis præsertim, ventricosis, obliquè lineis incrementi, striatis, ultimo majori, cæteris duplè longiori, fasciâ diversicolore, plerùmque albâ, prope suturam : aperturâ suborbiculari, peristomate plerumque albo, extus reflexo ; columellâ albâ, rectiusculâ, anticè subcallosâ, subsinuâtâ.* Long. 1·9, lat. 1·3 poll.

H. virido-striata, Lea secund. Jay.

Hab. in foliis arborum ad insulam Temple dictam Philippinarum.

One of the most beautiful, as well as one of the most variable species in colour. In its general form it is very near var. *b.* of Lamarck's *Helix galactites* (*H. mirabilis*, De F. Hist. Nat. Gen. et Part. des Mollusques terr. et fluv. t. 31. f. 4 to 6), which has been called *H. Philippinarum*, but from which it may easily be distinguished by attention to the above characters. The following seven varieties in colour have been brought by Mr. Cuming : viz. var. *a.* bright green, with darker, longitudinal, oblique, slightly undulated lines and bands, and a white band at the suture : var. *b.* the same, with the addition of a narrow, very darkly coloured brown band immediately below the white sutural band, and a broad spiral dark brown basal band : var. *c.* the same, with two additional dark brown bands on the last volution : var. *d.* bright light brown, with green, slightly undulated oblique longitudinal bands, and a white sutural band : var. *e.* the same as var. *a.*, but having the sutural band of a light and dark brown colour varied : var. *f.* of chestnut brown, with a white sutural band : var. *g.* of a dark chestnut brown, with a light orange brown sutural band.

This species is *Helix virido-striata* of Lea, according to Dr. Jay ; I know not if that name be published or not. I hope not, because it cannot be adopted, neither being consonant with the rules of nomenclature, nor with classic purity.

HELIX (COCHLOGENA De F.) FLORIDA. *Hel. testâ obovatâ, tenuiusculâ, haud nitente, anfractibus quinque ventricosis, tenuissimè obliquè striatis, ultimo majori, cæteris ferè duplè longiori ; suturâ minutissimè crenulatâ, albâ ; aperturâ suborbiculari peristomate latiusculo, reflexo, rotundato, albo ; columellâ albâ, subincurvâ.* Long. 1·6, lat. 1·1 poll.

Hab. in foliis arborum prope Munsolai ad insulam Mindoro Philippinarum.

This, like the last, is a very beautiful species, and it is also subject to much variation in colour ; its varieties, nevertheless, are not so numerous. It is principally remarkable for its surface being dull like the bloom upon green plums or grapes. The following varieties are exhibited by Mr. Cuming : viz. var. *a.* of an uniform green, becoming paler toward the apex, where it is white : var. *b.* green, with a brown band close to the white sutural band, and the apex of a

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reddish brown: var. *c.* green, with a dark brown band near the sutural band, and a dark brown spiral band close to the *columella*: var. *d.* the same, with two intermediate brown bands, both of which, however, are not continuous: var. *e.* brown, with a dark brown band next to the sutural white band, and the dark brown spiral band surrounding the *columella*. In all these varieties the narrow white sutural band is constant, and the anterior part of the last volution within the aperture is yellower than the outer surface.

HELIX (COCHLOGENA De F.) HYDROPHANA. *Hel. testâ obovatâ, tenuiusculâ, nitidâ, anfractibus quinque ventricosâ, obliquè tenerrimè striatis, ultimo majori, ceteris duplò longiori, omnibus plùs minùsve epidermide hydrophand indutis; aperturâ suborbiculari, peristomate albo, rotundato, reflexo; columellâ subarcuatâ, anticè in tuberculam indistinctam productâ. Long. 1.35, lat. 1.05 poll.*

Hab. prope Puerto Galero ad insulam Mindoro Philippinarum.

The ground colour of this extraordinary species is brownish yellow, and it has two, three, or four broader or narrower very dark brown spiral bands. A rather thinner variety, with three bands, is found in the island of Corregidor, in the Bay of Manilla. The most remarkable circumstance in its natural history is that it is more or less covered with a very thin, opaque, white *epidermis*, which becomes transparent on being wetted; the dark brown bands are then seen brilliantly contrasted with the yellowish brown general colour of the shell.

HELIX (HELICOSTYLA De F.) CEPOIDES. *Hel. testâ suborbiculari, tenui, spirâ subdepresso-conicâ; anfractibus senis, ventricosâ, posticè depressiusculis, lineis incrementi striatis; suturâ distinctâ; aperturâ semilunari, peristomate posticè tenui, subreflexo, tùm crassiori, reflexo; columellâ in dentem obtusum producto. Long. 1.8, lat. 2.2 poll.*

H. cepoides, Lea, M.S. secund. Jay.

Hab. ad insulam Luban Philippinarum.

This species most nearly resembles *H. unidentata*, Lam. Anim. sans Vert. VI. pt. 2, p. 74, from which it may easily be known by its more ventricose volutions, and its much narrower aperture. It differs also in colour, the *unidentata* being usually of a dark chestnut brown, while in the *Dolium* the spire and more than the upper half of the last volution are of a light brown, and the remainder lighter coloured still, and between the darker and lighter colour is a band of nearly white. The *epidermis* in this species is very thin and pale-coloured, and it has alternating darker marks close to the suture. A variety occurs of a nearly uniform pale brownish yellow colour, though in other respects similar.

I gladly adopt Lea's manuscript name of *cepoides*.

HELIX (HELICOSTYLA? De F.) ARATA. *Hel. testâ ovatâ, subcylindricâ, crassiusculâ, rufo-fuscescente, fasciâ antemedianâ albidâ; anfractibus senis, subventricosâ, obliquè exaratis, subrugosis; suturâ distinctâ, crenulatâ; aperturâ ferè circulari, intùs albâ,*

reddish brown: var. *c.* green, with a dark brown band near the sutural band, and a dark brown spiral band close to the *columella*: var. *d.* the same, with two intermediate brown bands, both of which, however, are not continuous: var. *e.* brown, with a dark brown band next to the sutural white band, and the dark brown spiral band surrounding the *columella*. In all these varieties the narrow white sutural band is constant, and the anterior part of the last volution within the aperture is yellower than the outer surface.

HELIX (COCHLOGENA De F.) HYDROPHANA. *Hel. testâ obovatâ, tenuiusculâ, nitidâ, anfractibus quinque ventricosis, obliquè tenerrimè striatis, ultimo majori, ceteris duplò longiori, omnibus plùs minùsve epidermide hydrophand indutis; aperturâ suborbiculari, peristomate albo, rotundato, reflexo; columellâ subarcuatâ, anticè in tuberculam indistinctam productâ.* Long. 1.35, lat. 1.05 poll.

Hab. prope Puerto Galero ad insulam Mindoro Philippinarum.

The ground colour of this extraordinary species is brownish yellow, and it has two, three, or four broader or narrower very dark brown spiral bands. A rather thinner variety, with three bands, is found in the island of Corregidor, in the Bay of Manilla. The most remarkable circumstance in its natural history is that it is more or less covered with a very thin, opaque, white *epidermis*, which becomes transparent on being wetted; the dark brown bands are then seen brilliantly contrasted with the yellowish brown general colour of the shell.

HELIX (HELICOSTYLA De F.) CEPOIDES. *Hel. testâ suborbiculari, tenui, spirâ subdepresso-conicâ; anfractibus senis, ventricosis, posticè depressiusculis, lineis incrementi striatis; suturâ distinctâ; aperturâ semilunari, peristomate posticè tenui, subreflexo, tùm crassiori, reflexo; columellâ in dentem obtusum producto.* Long. 1.8, lat. 2.2 poll.

H. cepoides, Lea, M.S. secund. Jay.

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reddish brown: var. *c.* green, with a dark brown band near the sutural band, and a dark brown spiral band close to the *columella*: var. *d.* the same, with two intermediate brown bands, both of which, however, are not continuous: var. *e.* brown, with a dark brown band next to the sutural white band, and the dark brown spiral band surrounding the *columella*. In all these varieties the narrow white sutural band is constant, and the anterior part of the last volution within the aperture is yellower than the outer surface.

HELIX (COCHLOGENA De F.) HYDROPHANA. *Hel. testâ obovatâ, tenuiusculâ, nitidâ, anfractibus quinque ventricosis, obliquè tenerrimè striatis, ultimo majori, ceteris duplò longiori, omnibus plùs minùsve epidermide hydrophand indutis; aperturâ suborbiculari, peristomate albo, rotundato, reflexo; columellâ subarcuatâ, anticè in tuberculam indistinctam productâ.* Long. 1.35, lat. 1.05 poll.

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The ground colour of this extraordinary species is brownish yellow, and it has two, three, or four broader or narrower very dark brown spiral bands. A rather thinner variety, with three bands, is found in the island of Corregidor, in the Bay of Manilla. The most remarkable circumstance in its natural history is that it is more or less covered with a very thin, opaque, white *epidermis*, which becomes transparent on being wetted; the dark brown bands are then seen brilliantly contrasted with the yellowish brown general colour of the shell.

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H. cepoides, Lea, M.S. secund. Jay.

Hab. ad insulam Luban Philippinarum.

This species most nearly resembles *H. unidentata*, Lam. Anim. sans Vert. VI. pt. 2, p. 74, from which it may easily be known by its more ventricose volutions, and its much narrower aperture. It differs also in colour, the *unidentata* being usually of a dark chestnut brown, while in the *Dolium* the spire and more than the upper half of the last volution are of a light brown, and the remainder lighter coloured still, and between the darker and lighter colour is a band of nearly white. The *epidermis* in this species is very thin and pale-coloured, and it has alternating darker marks close to the suture. A variety occurs of a nearly uniform pale brownish yellow colour, though in other respects similar.

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HELIX (HELICOSTYLA? De F.) ARATA. *Hel. testâ ovatâ, subcylindricâ, crassiusculâ, rufo-fuscescente, fasciâ antemediâ albâ; anfractibus senis, subventricosis, obliquè exaratis, subrugosis; suturâ distinctâ, crenulatâ; aperturâ ferè circulari, intùs albâ,*

peritremate expanso, subreflexo, fusco; columellâ alba; umbilico mediocri. Long. 1·7, lat. 1·1 poll.

Hab. ad insulam Tablas Philippinarum.

Variat testâ omninò pallidè lutescente, aperturâ peritremateque albis.

The two varieties of this remarkable species differ so much in colour that they might at first sight be regarded as distinct species; I do not, however, discover any real difference in their conformation, and therefore am compelled to unite them as varieties. The ridges between the furrows vary greatly in their distance from each other; they appear to be more and more frequent as the shell increases in age.

HELIX (HELICOSTYLA? De F.) ADUSTA. *Hel. testâ oblongâ, subcylindricâ, castaneâ, lævigatâ, tenuissimè lineis incrementi striatâ, fasciâ antemediâ pallidiori; anfractibus senis subventricosis; suturâ distinctâ; aperturâ ferè circulari, intùs albicante; peritremate levitèr expanso, reflexo, fusco; columellâ pallidâ; umbilico parvo.* Long. 1·8, lat. 1· poll.

Hab. ad insulam Tablas Philippinarum.

This species resembles the last in form as well as colour; it differs, however, in its general proportions, as well as in being entirely free from the numerous and deep oblique grooves so remarkable in that species; its *umbilicus* also is smaller.

HELIX (HELICOSTYLA? De F.) BRACHYODON. *Hel. testâ ovato-subcylindricâ, tenui, castaneâ, fasciâ anticâ pallescente; anfractibus quinque ad sex subventricosis, lineis incrementi tenuitèr obliquè striatis; suturâ distinctâ, levitèr crenulatâ; aperturâ suborbiculari, intùs albicante; dente obtuso, antico, albo; peritremate subincrassato, reflexo, subexpanso, internè inter columellam dentemque sinuato; columellâ alba, obtusâ; umbilico parvo.* Long. 1·95, lat. 1·3 poll.

Hab. in foliis arborum prope Puerto Galero ad insulam Mindoro Philippinarum.

Variat testâ breviori, colore saturatiori, striisque fortioribus. Long. 1·35, lat. 1·2 poll.

I have named this species *Brachyodon*, from a short white tooth placed at the inner and anterior part of the lip, and which appears to be constant, I do not hesitate to regard the shorter specimens as merely a variety, though they differ greatly in their proportions from the typical variety. A single nearly colourless specimen is intermediate in its proportions.

HELIX (COCHLOGENA De F.) PULCHERRIMA. *Hel. testâ orbiculari, subglobosâ, tenuiusculâ, haud nitente, spirâ plerùmque subdepressâ, anfractibus $4\frac{1}{2}$, ventricosis, lævibus, striis solùm incrementi tenuissimis insculptis, coloribus pulcherrimè ornatis, ultimo maximo, cæteris quadruplò longiori; suturâ distinctè impressâ; aperturâ rotundato-semilunari, intùs albâ, peristomate latiusculo, rotundato, reflexo, extùs ad basin columellæ subsinuato; columellâ dilatâ, subplanulatâ.* Long. 1·5, lat. 2· poll.

Hab. prope St. Jaun in provinciâ Cagayan insulæ Luçon Philippinarum.

peritremate expanso, subreflexo, fusco; columellâ alba; umbilico mediocri. Long. 1·7, lat. 1·1 poll.

Hab. ad insulam Tablas Philippinarum.

Variat testâ omninò pallidè lutescente, aperturâ peritremateque albis.

The two varieties of this remarkable species differ so much in colour that they might at first sight be regarded as distinct species; I do not, however, discover any real difference in their conformation, and therefore am compelled to unite them as varieties. The ridges between the furrows vary greatly in their distance from each other; they appear to be more and more frequent as the shell increases in age.

HELIX (HELICOSTYLA ? De F.) ADUSTA. *Hel. testâ oblongâ, subcylindricâ, castaneâ, lævigatâ, tenuissimè lineis incrementi striatâ, fasciâ antemediâ pallidiori; anfractibus senis subventricosis; suturâ distinctâ; aperturâ ferè circulari, intùs albicante; peritremate levitèr expanso, reflexo, fusco; columellâ pallidâ; umbilico parvo.* Long. 1·8, lat. 1· poll.

Hab. ad insulam Tablas Philippinarum.

This species resembles the last in form as well as colour; it differs, however, in its general proportions, as well as in being entirely free from the numerous and deep oblique grooves so remarkable in that species; its *umbilicus* also is smaller.

HELIX (HELICOSTYLA ? De F.) BRACHYODON. *Hel. testâ ovato-subcylindricâ, tenui, castaneâ, fasciâ anticâ pallescente; anfractibus quinque ad sex subventricosis, lineis incrementi tenuitèr obliquè striatis; suturâ distinctâ, levitèr crenulatâ; aperturâ suborbiculari, intùs albicante; dente obtuso, antico, albo; peritremate subincrassato, reflexo, subexpanso, internè inter columellam dentemque sinuato; columellâ alba, obtusâ; umbilico parvo.* Long. 1·95, lat. 1·3 poll.

Hab. in foliis arborum prope Puerto Galero ad insulam Mindoro Philippinarum.

Variat testâ breviori, colore saturatiori, striisque fortioribus. Long. 1·35, lat. 1·2 poll.

I have named this species *Brachyodon*, from a short white tooth placed at the inner and anterior part of the lip, and which appears to be constant, I do not hesitate to regard the shorter specimens as merely a variety, though they differ greatly in their proportions from the typical variety. A single nearly colourless specimen is intermediate in its proportions.

HELIX (COCHLOGENA De F.) PULCHERRIMA. *Hel. testâ orbiculari, subglobosâ, tenuiusculâ, haud nitente, spirâ plerùmque subdepressâ, anfractibus $4\frac{1}{2}$, ventricosis, lævibus, striis solùm incrementi tenuissimis insculptis, coloribus pulcherrimè ornatis, ultimo maximo, cæteris quadruplò longiori; suturâ distinctè impressâ; aperturâ rotundato-semilunari, intùs albâ, peristomate latiusculo, rotundato, reflexo, extùs ad basin columellæ subsinuato; columellâ dilatâ, subplanulatâ.* Long. 1·5, lat. 2· poll.

Hab. prope St. Jaun in provinciâ Cagayan insulæ Luçon Philippinarum.

peritremate expanso, subreflexo, fusco; columellâ alba; umbilico mediocri. Long. 1·7, lat. 1·1 poll.

Hab. ad insulam Tablas Philippinarum.

Variat testâ omninò pallidè lutescente, aperturâ peritremateque albis.

The two varieties of this remarkable species differ so much in colour that they might at first sight be regarded as distinct species; I do not, however, discover any real difference in their conformation, and therefore am compelled to unite them as varieties. The ridges between the furrows vary greatly in their distance from each other; they appear to be more and more frequent as the shell increases in age.

HELIX (HELICOSTYLA ? De F.) ADUSTA. *Hel. testâ oblongâ, subcylindricâ, castaneâ, lævigatâ, tenuissimè lineis incrementi striatâ, fasciâ antemediâ pallidiori; anfractibus senis subventricosis; suturâ distinctâ; aperturâ ferè circulari, intùs albicante; peritremate levitèr expanso, reflexo, fusco; columellâ pallidâ; umbilico parvo.* Long. 1·8, lat. 1· poll.

Hab. ad insulam Tablas Philippinarum.

This species resembles the last in form as well as colour; it differs, however, in its general proportions, as well as in being entirely free from the numerous and deep oblique grooves so remarkable in that species; its *umbilicus* also is smaller.

HELIX (HELICOSTYLA ? De F.) BRACHYODON. *Hel. testâ ovato-subcylindricâ, tenui, castaneâ, fasciâ anticâ pallescente; anfractibus quinque ad sex subventricosis, lineis incrementi tenuitèr obliquè striatis; suturâ distinctâ, levitèr crenulatâ; aperturâ suborbiculari, intùs albicante; dente obtuso, antico, albo; peritremate subincrassato, reflexo, subexpanso, internè inter columellam dentemque sinuato; columellâ alba, obtusâ; umbilico parvo.* Long. 1·95, lat. 1·3 poll.

Hab. in foliis arborum prope Puerto Galero ad insulam Mindoro Philippinarum.

Variat testâ breviori, colore saturatiori, striisque fortioribus. Long. 1·35, lat. 1·2 poll.

I have named this species *Brachyodon*, from a short white tooth placed at the inner and anterior part of the lip, and which appears to be constant, I do not hesitate to regard the shorter specimens as merely a variety, though they differ greatly in their proportions from the typical variety. A single nearly colourless specimen is intermediate in its proportions.

HELIX (COCHLOGENA De F.) PULCHERRIMA. *Hel. testâ orbiculari, subglobosâ, tenuiusculâ, haud nitente, spirâ plerùmque subdepressâ, anfractibus $4\frac{1}{2}$, ventricosis, lævibus, striis solùm incrementi tenuissimis insculptis, coloribus pulcherrimè ornatis, ultimo maximo, cæteris quadruplò longiori; suturâ distinctè impressâ; aperturâ rotundato-semilunari, intùs albâ, peristomate latiusculo, rotundato, reflexo, extùs ad basin columellæ subsinuato; columellâ dilatâ, subplanulatâ.* Long. 1·5, lat. 2· poll.

Hab. prope St. Jaun in provinciâ Cagayan insulæ Luçon Philippinarum.

The usual ground colour of this very pretty shell varies from a pale yellowish brown, through orange brown, to dark chestnut brown; some of its varieties are of a nearly uniform colour, others are very elegantly varied, with narrower or broader, and more or less numerous interrupted bands of opaque white *epidermis* (which are transparent when wetted), and which gives them a very brilliant and captivating appearance, to which it is indeed impossible in words to do justice.

This species is usually about the same size as *Helix Pomatia*, differing from that, however, very greatly in form and proportions, and varying, moreover, greatly in size. It is nearly orbicular, somewhat globose, with a slightly depressed obtuse spire. It is of a thin substance, and its surface is dull. Its volutions are four and a half, of which the first is rounded, and the last is very large, being four times as long as the rest, and very ventricose; they are smooth, being closely covered with the very slender lines of growth; the suture is very distinct, inasmuch as that the posterior part of the next volution is nearly horizontal, and the anterior part of the last volution nearly perpendicular to it. The aperture is large (not so large in proportion as Deshayes's *Helix Cailliaudi*, Mag. de Zool., 1839, 'Mollusques,' Pl. 5.), of a rounded semilunar form, and white within: the peristome is rather broad and thick, rounded and reflected; in some varieties it is quite white, in others it is delicately coloured of a rose tint, and sometimes of a brownish red: the *columella* is dilated and rather flattened, usually quite white, though occasionally tinged with rose.

The following are the twelve principal varieties which have occurred to Mr. Cuming, viz.

Var. *a*. General colour dark chestnut brown; apex brownish scarlet; edge of the peristome purplish crimson; body covered with broader and narrower white interrupted bands, set nearly close together.

Var. *b*. The same, only not having so many of the white bands, the ground colour is seen in broader bands.

Var. *c*. General colour dark chestnut brown, with numerous interrupted bands of light brown *epidermis*; apex brownish scarlet; edge of the peristome purplish brown.

Var. *d*. Ground colour orange brown, with numerous white interrupted bands; peristome white.

Var. *e*. Dark chestnut brown, with only three or four light-coloured interrupted bands, so that the dark brown ground colour appears in broad bands.

Var. *f*. Light yellowish brown, with the apex red, and the edge of the peristome rose colour; numerous close-set, interrupted, nearly white bands ornament this variety.

Var. *g*. The same ground colour as the last, with a light buff-coloured edge to peristome, and a single white scarcely interrupted band, forming the circumference of the shell.

Var. *h*. With a chestnut brown ground colour, a red apex, and orange-coloured edge to the peristome, and one white band, forming the circumference.

The usual ground colour of this very pretty shell varies from a pale yellowish brown, through orange brown, to dark chestnut brown; some of its varieties are of a nearly uniform colour, others are very elegantly varied, with narrower or broader, and more or less numerous interrupted bands of opaque white *epidermis* (which are transparent when wetted), and which gives them a very brilliant and captivating appearance, to which it is indeed impossible in words to do justice.

This species is usually about the same size as *Helix Pomatia*, differing from that, however, very greatly in form and proportions, and varying, moreover, greatly in size. It is nearly orbicular, somewhat globose, with a slightly depressed obtuse spire. It is of a thin substance, and its surface is dull. Its volutions are four and a half, of which the first is rounded, and the last is very large, being four times as long as the rest, and very ventricose; they are smooth, being closely covered with the very slender lines of growth; the suture is very distinct, inasmuch as that the posterior part of the next volution is nearly horizontal, and the anterior part of the last volution nearly perpendicular to it. The aperture is large (not so large in proportion as Deshayes's *Helix Cailliaudi*, Mag. de Zool., 1839, 'Mollusques,' Pl. 5.), of a rounded semilunar form, and white within: the peristome is rather broad and thick, rounded and reflected; in some varieties it is quite white, in others it is delicately coloured of a rose tint, and sometimes of a brownish red: the *columella* is dilated and rather flattened, usually quite white, though occasionally tinged with rose.

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Var. *a*. General colour dark chestnut brown; apex brownish scarlet; edge of the peristome purplish crimson; body covered with broader and narrower white interrupted bands, set nearly close together.

Var. *b*. The same, only not having so many of the white bands, the ground colour is seen in broader bands.

Var. *c*. General colour dark chestnut brown, with numerous interrupted bands of light brown *epidermis*; apex brownish scarlet; edge of the peristome purplish brown.

Var. *d*. Ground colour orange brown, with numerous white interrupted bands; peristome white.

Var. *e*. Dark chestnut brown, with only three or four light-coloured interrupted bands, so that the dark brown ground colour appears in broad bands.

Var. *f*. Light yellowish brown, with the apex red, and the edge of the peristome rose colour; numerous close-set, interrupted, nearly white bands ornament this variety.

Var. *g*. The same ground colour as the last, with a light buff-coloured edge to peristome, and a single white scarcely interrupted band, forming the circumference of the shell.

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Var. *b*. The same, only not having so many of the white bands, the ground colour is seen in broader bands.

Var. *c*. General colour dark chestnut brown, with numerous interrupted bands of light brown *epidermis*; apex brownish scarlet; edge of the peristome purplish brown.

Var. *d*. Ground colour orange brown, with numerous white interrupted bands; peristome white.

Var. *e*. Dark chestnut brown, with only three or four light-coloured interrupted bands, so that the dark brown ground colour appears in broad bands.

Var. *f*. Light yellowish brown, with the apex red, and the edge of the peristome rose colour; numerous close-set, interrupted, nearly white bands ornament this variety.

Var. *g*. The same ground colour as the last, with a light buff-coloured edge to peristome, and a single white scarcely interrupted band, forming the circumference of the shell.

Var. *h*. With a chestnut brown ground colour, a red apex, and orange-coloured edge to the peristome, and one white band, forming the circumference.

Var. *i*. With a chestnut brown ground, a red apex, and an orange-coloured edge to the outside of the pink-edged peristome, and without any white band but a slender white sutural line.

Var. *k*. With a yellowish brown ground colour, the apex and the back of the peristome bright orange-red; peristome and columella rose-coloured; without a band, but with a slender white suture line.

Var. *l*. Of an uniform yellowish brown, with white peristome.

Var. *m*. Of an uniform pale brownish yellow, with white peristome.

The most beautiful varieties are most abundant on the leaves of bushes and young trees at St. Jaun, where also all the other varieties are found. Some of the lesser painted varieties are also found at Abulug in the same province. The species has not been found in any other part of the Philippine Islands.

Since this paper was read two other varieties have been found by Mr. Cuming in his packages; they are

Var. *n*. Of a very rich dark chestnut brown, with a scarlet apex, four very narrow interrupted white bands of *epidermis*, a white suture, and orange-coloured outer edge to the white peristome.

Var. *o*. Of a rich light brown colour, with a yellowish band forming the circumference of the shell, and another band of the same yellowish colour in front, near the *columella*; peristome white, its edge pink, and back of the lip orange-yellow.

MISCELLANEOUS.

ZOOLOGICAL OBSERVATIONS MADE IN THE NEIGHBOURHOOD OF TENBY.

BY J. F. DAVIS, M.D. WITH A PLATE.

To the Editors of the Annals and Magazine of Natural History.

Bath, Oct. 23rd, 1840.

GENTLEMEN,—During a temporary sojourn at Tenby in August last, I was induced to see a large fish in the possession of a publican and fisherman named Cadwallader, which he had taken in Tenby Bay the preceding autumn, while employed in the capture of herrings. It had been tolerably well-preserved and was kept for exhibition, being by no means destitute of attraction. It measures ten feet in length and six feet in girth, between the eyes two feet and a half, and has the appearance of belonging to the Sharks; but its most remarkable feature is the head, which, as Cuvier remarks of the Hammer-headed Shark, is unlike to anything in the whole animal kingdom besides. It is a female, and when opened was found to contain a considerable number of young ones about eighteen inches long, one of which is stuffed and exhibited with the mother. Upon my return to Bath in September I had an opportunity of referring to Mr. Yarrell's late work on British Fishes, where there is the following notice of this animal as an occasional visitant of our coasts. "The genus of Sharks next in order, according to Cuvier's arrangement in the '*Règne Animale*,' is that of *Zygæna* or Hammer-headed Sharks, of which a single specimen is recorded by Messrs. C. and J. Paget, in their '*Sketch of the Natural History of Yarmouth*,' p. 17, to have been taken there in October 1829, the head of which is now preserved in

Var. *i*. With a chestnut brown ground, a red apex, and an orange-coloured edge to the outside of the pink-edged peristome, and without any white band but a slender white sutural line.

Var. *k*. With a yellowish brown ground colour, the apex and the back of the peristome bright orange-red; peristome and columella rose-coloured; without a band, but with a slender white suture line.

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